反应堆工程

ADS原理验证装置两种方案的热工水力分析

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摘要 加速器驱动的次临界系统（ADS）项目是"973项目"之一，旨在解决ADS的关键技术问题。其中，"原理验证装置的设计"课题可为ADS关键技术的解决和走向工程化奠定基础。文章就两种不同的堆芯方案陈述了ADS原理验证装置热工水力的计算，计算由初始稳态运行和瞬态及事故工况组成。为考察两种方案的自然循环能力，选择失流事故进行瞬态分析。对瞬态工况的严重性和两种方案的结果进行了比较，结果表明：事故工况下自然循环可足够带走堆芯余热，且方案1比方案2的安全裕度大。

关键词 加速器驱动的次临界系统 热工水力 嬗变 RELAP5程序
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Thermal-Hydraulic Research of Two Schemes on ADS Principle Verification Facility

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Abstract Accelerator-driven sub-critical system （ADS） project is one of "973 Project", which aims to solve ADS key issue. The design of principle verification facility could provide the platform of solving ADS key issue and engineering design. Based on two different core schemes, the paper presents the thermal-hydraulic theoretical analysis on ADS principle verification device. It consists of initial steady and transient accidental analysis. To find out the level of natural circulation, loss of flow was researched in transient analysis. In the end, the seriousness of transient cases and the result of two schemes were compared. The results show that in transient accident the natural circulation can remove core residual heat enough; and the first scheme is bigger than the second scheme in terms of safe margin.

Key words accelerator-driven sub-critical system thermal-hydraulic transmutation RELAP5 code

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